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(54) Improvements in or relating to channel fixing devices.

(57) A spring (40) is provided which may readily be formed from resilient plastics and which can be used, in place of the conventional captive steel wire coil spring to hold in its desired place in a channel section member (12) a channel nut (16) to receive a screw-threaded bolt (26) for securing a structural member (24), for example to the channel section member, the spring (40) comprises a plug portion, comprising a spigot (46), head (47) and radially projecting vanes (48) and a resiliently flexible portion in the form of a fork or inverted "U", comprising legs (42) and a connecting portion (44), the plug portion (46, 47, 48) projecting from the connecting portion (44). In use, the plug portion (46, 47, 48) is inserted as an interference fit in the bore of the channel nut to be secured, then is inserted in the fixing channel (12) with the nut, elastically stressing the legs (42) by engagement of the legs with the channel base, and the nut is turned through 90° within the channel so that it is held in place by the spring. Subsequent insertion of the bolt (26) into the bore in the nut drives out the plug portion, allowing the spring (40) to be recovered, for re-use if undamaged.

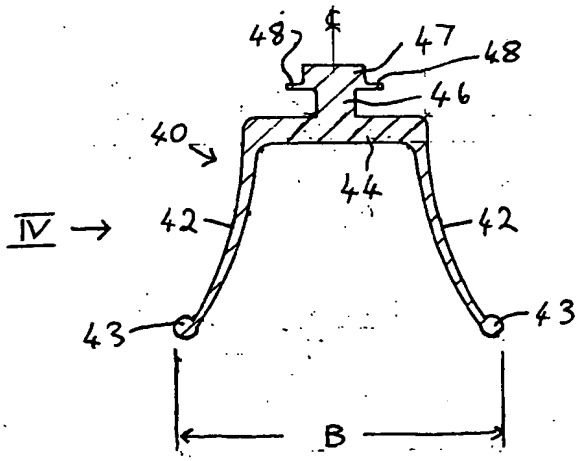

Fig.3

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interference fit in the screw-threaded bore 18. The arrangement is such that the spigot 46, and head 47, with the vanes 48, may be pushed readily into the bore 18 of a channel nut but that the vanes 48 will engage frictionally with the screw threaded bore 18 sufficiently to keep the spring 40 connected with the nut unless it is forcibly removed. The spigot 46, head 47 and vanes 48 thus constitute a plug portion adapted for reception in the screw-threaded bore 18 of a channel nut. The legs 42 are preferably of a width substantially greater than their thickness and each terminates, at its free end, in a transversely elongate bearing surface, for engagement with the base 10 of the channel, said bearing surface, in the embodiment shown, being afforded by a respective transversely elongate bead 43 of substantially circular cross section. The legs 42 are preferably bowed somewhat as illustrated in Figure 3 to facilitate resilient flexing of the legs. The width of the spring, i.e. as measured along the line of sight in Figure 3, is, of course, somewhat less than the width of the channel mouth, to allow insertion of the spring, with the nut thereon, into the channel. The dimension B (Figure 3) between the free ends of the legs 42 is, however, preferably substantially greater than even the internal width of the channel, so that once inserted, with a nut, into the channel, the spring is prevented, by the channel sides, from rotating fully with the nut. Thus, using the spring in accordance with the invention, the operation of fitting a nut, of the form described with reference to Figure 1, but without the wire spring 30, into a channel, of the form described with reference to Figure 1, is as follows:

The spigot 46 of the spring with the head 47 and vanes 48, is inserted into the bore 18 of the nut from the underside of the nut, i.e. from the face opposite that provided with the transverse grooves. The nut and spring are then inserted through the channel mouth, with the legs 42 being spaced apart in the longitudinal direction of the channel and with the longer dimension of the nut being likewise aligned with the longitudinal direction of the channel. As the nut, with the spring, is inserted into the channel, the bearing surfaces at the free ends of the legs 42 engage the base 10 of the channel and, partially as a result of sliding of the bearing surfaces along the base 10 of the channel with the consequent springing apart of the legs 42 relative to the connecting portion 44 and partially as a result of bowing of the legs 42, the spring 40 is resiliently stressed as the nut reaches the position in which it lies below (i.e. inwardly of) the flanges 14 and inturned edges 15. The nut is now rotated through 90°, while the spring remains stationary, (the nut thus rotating on the spigot 46, head 47 and vanes 48), the nut being thereafter released allowing the spring to push the nut against the inturned edges 15 of the channel so that the inturned edges engage in the grooves 22. Thus, the nut is held in position until the respective bolt 18 is screwed into it.

When the bolt fixing a fitting to the channel face is screwed into the nut, the end of the bolt pushes on the end of head 47 causing the vanes 48 to deform and disengaging the spring from the nut. The spring, now redundant, either falls away or is freely removed from inside the channel. Provided that the vanes 48 are undamaged, the spring may be reused. Because the spring 40 is a push fit in the nut, it may be applied at the factory or on site by the erector.

The spring 40 described above has the following features and benefits.

1. It is cost effective.
2. The nut is undedicated. A spring can be fitted at any time to any nut and does not need special fixing equipment.
3. The nut/spring assembly is extremely stable. The transverse width of each leg and the spread of those legs make it virtually impossible to upset the assembly when offering it up to the channel.
4. The nuts and springs can be sold separately, and if factory assembled will not entangle in the box.
5. The plastic springs are cleared from each nut when assembly is complete thus affording a free passageway along the inside of the channel.
6. The springs may be re-used.
7. As the spring is made of non-ferrous material there is no rusting of the spring to cause rust staining of the channel.

It will be appreciated that many variations are possible within the scope of the appended claims. Thus, for example, the spring may be made of some other material, for example rubber or spring steel (with appropriate changes to the configuration of the spring to suit the material used). The spring may have legs of a different form from that illustrated or may have some analogous formation, for example in the form of a split skirt or concertina-shaped formations.

Claims

1. A spring for a channel nut of the kind specified comprising a body affording a plug portion adapted for reception in the screw-threaded bore of the channel nut and a resiliently flexible portion providing parts adapted for engagement with the bottom of a channel to allow said resiliently flexible portion to urge said plug portion, and thus any said channel nut engaged therewith, away from such channel

bore.

2. A spring according to claim 1 which is in the form of a unitary moulding of resilient plastics.

3. A spring according to claim 2 or claim 3 wherein said resiliently flexible portion comprises a pair of legs diverging from a connecting portion carrying said plug portion.

4. The combination of a channel nut of the kind specified with a spring according to any of claims 1 to 3.

5. A method of assembling a structure comprising a channel of the kind specified, and a further member secured to said channel by means of a bolt screwed into a channel nut of the kind specified, the method comprising fitting a spring according to any of claims 1 to 3 to the rear side of the channel nut, with the plug portion of the spring engaged in the screw-threaded bore in the nut fitting the nut/spring combination into said channel so that said parts of the resiliently flexible portion engage the bottom of the channel and the nut, with its longer dimension extending in the longitudinal direction of the channel, passes into the channel between the channel flanges, and thereby resiliently stressing said flexible portion of the spring, turning the nut, after pushing it past said flanges, so that its longer dimension lies transverse to the channel and the ends of the nut locate behind said flanges, and thereafter releasing the nut whereby the latter is held by the spring against said flanges, in the desired position, to allow said bolt to be screwed into the bore of the nut.

6. A structure assembled by the method of claim 5.

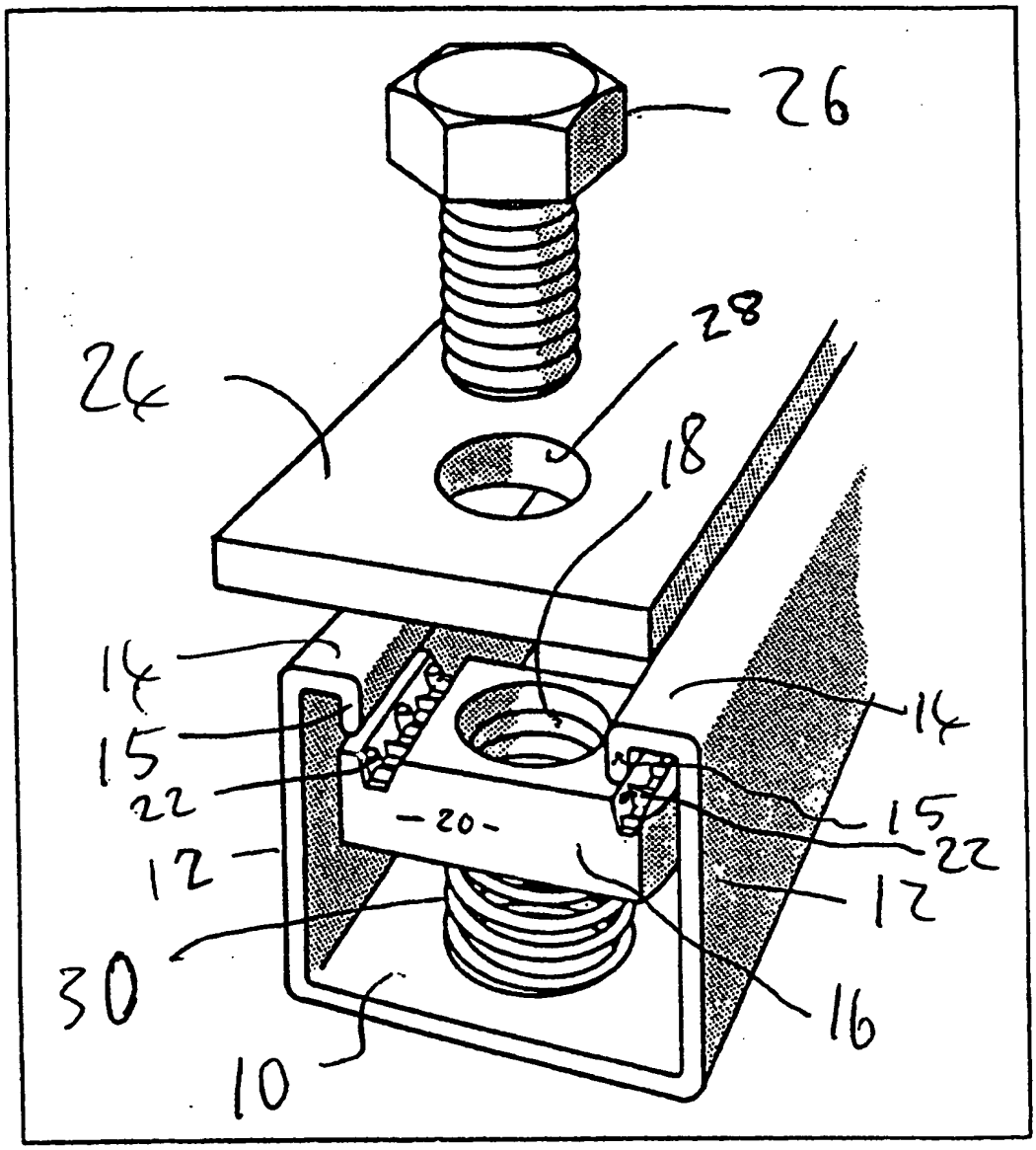

Fig. 1

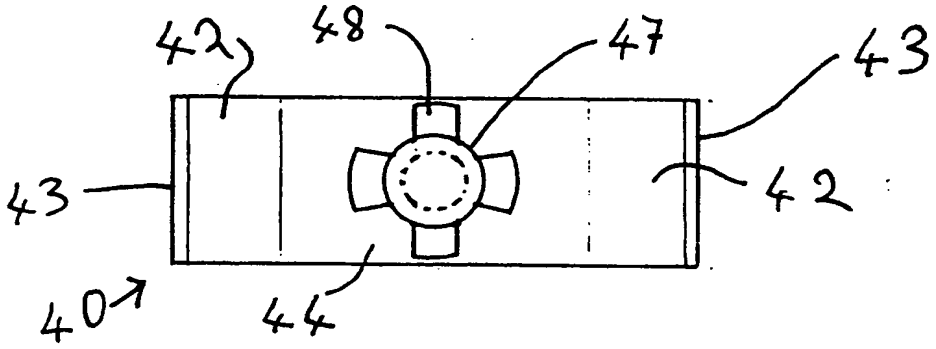

Fig 2

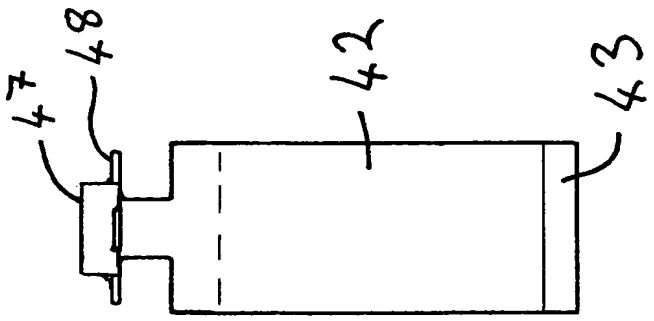

Fig.4

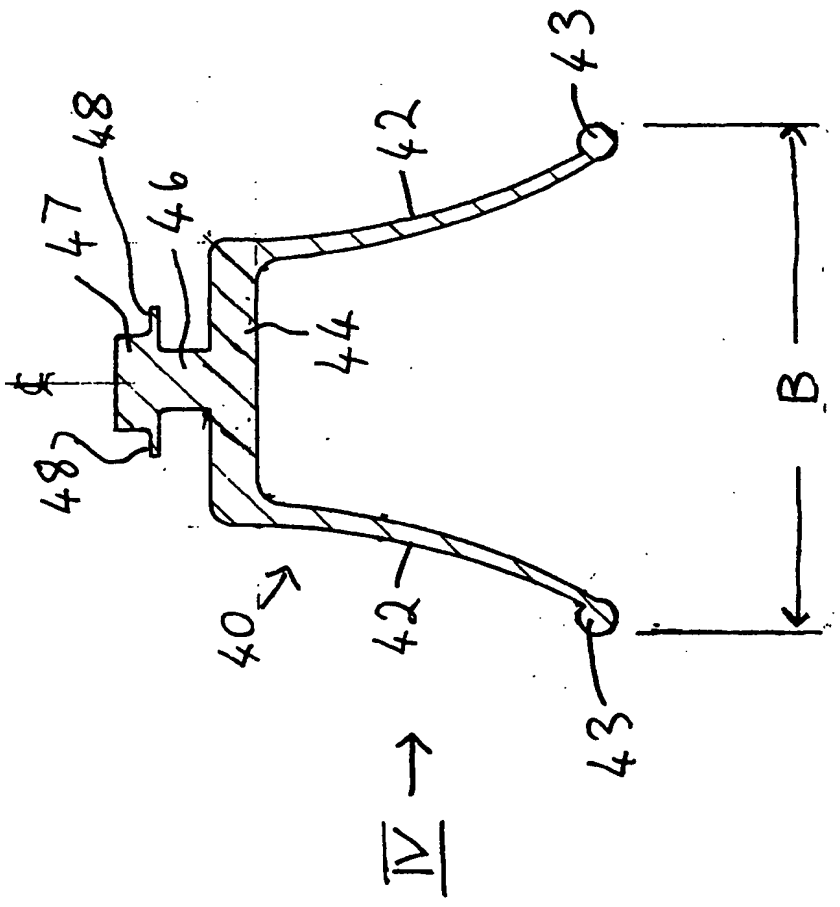

Fig.3

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EUROPEAN SEARCH REPORT

Application Number

EP 92 30 4484

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 741 582 (PERONI) * column 2, line 27 - line 41 * * column 3, line 14 - line 19; figures 1-10 *	1-4,6	F16B37/04 F16F1/18
A	EP-A-0 149 128 (GTE PRODUCTS CORPORATION) * page 8, line 3 - line 16; figures 1-14 *	1,5	
A	GB-A-602 540 (CRUDEN) * page 2, line 47 - page 3, line 15; figures 1,2 *	1,6	
A	DE-A-2 635 439 (HANS KNURR KG MECHANIK FUR DIE ELEKTRONIK) * page 11, line 11 - page 14, line 6; figures 1-6 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

F16B
F16F
E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11 SEPTEMBER 1992	CALAMIDA G.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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